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**PSYCHOLOGICAL SOURCES OF RESPONSE EFFECTS
IN SELF-ADMINISTERED AND TELEPHONE SURVEYS**

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PSYCHOLOGICAL SOURCES OF RESPONSE EFFECTS
IN SELF-ADMINISTERED AND TELEPHONE SURVEYS

Abstract

The impact of mode of data collection (self-administered questionnaire vs. telephone interview) on the emergence of response effects and the accuracy of recall from memory was explored in a cross-cultural experiment, conducted in the U.S. and the Federal Republic of Germany. As predicted on the basis of psychological considerations, question order effects were obtained under telephone interview conditions but not under self-administered conditions, where question order is eliminated by the opportunity to browse back and forth through the questionnaire. On the other hand, the impact of the content of related questions was more pronounced under self-administered than under telephone interview conditions, independent of the order in which they were presented. This reflects respondents' differential opportunity to elaborate on related questions under both administration modes, as well as the necessity to rely on the content of presumably related questions in determining the meaning of ambiguous questions under self-administered conditions. Finally, respondents' recall of the date of public events was more accurate under self-administered than under telephone interview conditions, reflecting the beneficial effect of having sufficient time to work on the recall task.

**PSYCHOLOGICAL SOURCES OF RESPONSE EFFECTS
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Survey researchers are well aware that the results of public opinion surveys can be significantly affected by the way in which questions are worded, the form in which they are presented, and the order or context in which they are asked. Nearly all of this evidence, however, has come from survey interviews conducted either face-to-face or by telephone, mostly from the latter (see e.g., Bishop 1987a, 1987b; Bishop et al., 1980, 1982a, 1982b, 1983, 1984a, 1984b, 1985, 1986; Crespi and Morris, 1984; McClendon, 1986; Schuman, Kalton, and Ludwig, 1983; Schuman and Ludwig, 1983; Schuman, Ludwig, and Krosnick, 1986; Schuman and Presser, 1981; Smith, 1982). With two exceptions (Ayidiya, 1987; Hippler and Schwarz, 1986), none of the better-known response effects reported in the literature have, to our knowledge, been replicated in self-administered or mail questionnaires. Psychological theorizing suggests, however, that the mode of data collection may affect the cognitive processes that underlie response effects. If so, some response effects may be unlikely to generalize to self-administered surveys, while others may be expected to emerge independently of the mode of administration. Experimental investigations of the impact of mode of data collection on the emergence of response effects are therefore of considerable theoretical as well as applied interest.

In the present paper, we will first review the major psychological differences between face-to-face and telephone interviews as well as self-administered questionnaires, elaborating on their relevance to the cognitive processes that underlie the process of question answering.

Subsequently, we will report a cross-cultural study designed to test some of the hypotheses suggested by our theoretical considerations.

Modes of Data Collection and the Process of Question Answering

To answer a survey question, the respondent must first interpret the question to determine its meaning. Subsequently, he or she has to retrieve relevant information from memory to form a judgment. Once a "private" judgment is formed in the respondent's mind, it may need to be formatted to fit the response alternatives provided by the researcher. Moreover, respondents may wish to edit their response before they communicate it to the interviewer, due to influences of social desirability and situational adequacy (see Strack & Martin, 1987 for a detailed discussion of each of these steps, and Tourangeau and Rasinski, 1988 for a similar model). Each of these operations may be affected by psychological variables that are likely to covary with the mode of data collection. Chart 1 shows a summary of these variables.

Chart 1

Visual vs. Auditory Presentation of the Stimuli. One of the most obvious differences between the modes of administration is the sensory channel in which the material is presented. In self-administered questionnaires, the items are visually displayed to the respondent who has

to read the material. In telephone interviews, as the other extreme, the items and the response alternatives are read to the respondent who has to listen to what the interviewer says. In face-to-face interviews both modes of presentation may occur.

Sequential vs. Simultaneous Presentation of the Items. Closely related to the previous distinction is the temporal order in which the material is presented. Telephone and face-to-face interviews have a strict sequential organization. That is, the respondent has to process the information in the temporal succession and the pace in which it is presented by the interviewer. The respondent cannot go back and forth or spend relatively more or less time on some particular item. To a certain degree, this is possible in self-administered questionnaires. Here, respondents can use as much time as they want to work on the questionnaire. Even if the questionnaire is administered in a classroom setting, in which the available amount of time is limited, they can at least allocate the time provided to them to those questions that they want to think about more carefully. Moreover, a self-administered questionnaire also allows respondents to go back to previous questions and to be reminded on their earlier answers (for a psychological discussion of these issues, see Anderson, 1980).

Time Pressure. Time pressure is a psychologically relevant variable that has been shown to increase "top of the head" phenomena, that is, reliance on the first thing that comes to mind (e.g., Kruglanski, 1980; Strack, Erber, & Wicklund, 1983). The greatest time pressure can be expected under telephone interview conditions, where moments of silent reflection cannot be bridged by nonverbal communication that indicates that the respondent is still paying attention to the task (Groves & Kahn, 1979).

The least degree of time pressure is induced by self-administered questionnaires that allow the respondent to work at his or her own pace. Face-to-face interviews create intermediate time pressure, due to the possibility of bridging pauses by nonverbal communication.

Additional Explanations from the Interviewer. In face-to-face interviews, where the interviewer can monitor the respondent's nonverbal expressions, and to a lesser degree under telephone interview conditions, where the interviewer is limited to monitoring the respondent's verbal utterances, respondents may be given additional information by the interviewer. Under both of these conditions, they are free to request additional information should they desire to do so. Even though the additional information is usually restricted to certain prescribed feedback, it may help the respondent to determine the meaning of the questions. Under self-administered questionnaire conditions, the respondent is much more dependent on the context that is explicitly provided by the questionnaire to draw inferences about the intended meaning of the questions (cf., Schwarz, & Strack, 1988; Schwarz, Strack, Chassein, & Muller, 1988; Strack, & Martin, 1987).

Social Desirability. The influence of social desirability depends significantly on the perceived anonymity of the responses. It has generally been found that respondents are more likely to answer in a socially desirable fashion if the questions are asked in a face-to-face interview and least likely in a self-administered questionnaire (Rogers, 1976; Strack, Schwarz, Chassein, Kern, & Wagner, 1988). Telephone interviews are likely to elicit intermediate social desirability concerns, due to the higher anonymity of the telephone interaction (see Frey, 1983, Ch.2; Groves, & Kahn, 1979).

Influence of Interviewer Characteristics. The direction of social desirability effects may well be mediated by characteristics of the interviewer (cf. Sudman and Bradburn, 1974). Such characteristics are more likely to be noticed by the respondent when he or she has face-to-face contact than when the interviewer cannot be seen, as is the case under telephone interview and self-administered questionnaire conditions.

Implications for Response Effects

What are the implications of these differences between data collection modes for different response effects?

Question Order and Question Context. Effects of the order in which questions are asked require sequential question presentation. Most question order effects should therefore be either reduced or absent under self-administered questionnaire conditions, depending on the proportion of respondents who read all or some of the questions before answering them.

This, however, does not imply that the broader "context" of a question is generally unlikely to affect responses under self-administered conditions. Rather, it implies that the impact of question context is less dependent on the order in which the questions are asked. In fact, context effects may be more likely under self-administered conditions than under face-to-face or telephone interview conditions, especially if respondents are asked an ambiguous question. While the meaning of an ambiguous question may be clarified under face-to-face and telephone conditions by requesting additional information from the interviewer, this is not the case under self-administered conditions. Rather, respondents in these conditions have to rely on the context of the ambiguous question to disambiguate its

meaning -- and they have the time to do so. This may result in more pronounced context effects. Note, however, that this does not imply a strict order effect because respondents under self-administered questionnaire conditions may use subsequent as well as preceding questions to accomplish disambiguation, and may come back to the ambiguous question once they determined a reasonable interpretation of its meaning.

Response Order Effects. Response order effects should be reduced or eliminated if respondents can read through all response alternatives without time pressure. Accordingly, they should be reduced in face-to-face interviews with showcards, relative to telephone interviews or face-to-face administration without showcards, and they should be least pronounced or absent under self-administered conditions. An exception may be long lists or item scales that respondents may read too hastily, or may not be able to keep in mind even if they studied all of them (Schuman & Presser, 1981, pp. 72 -74).

Question Wording and Question Form Effects. In contrast, question wording and question form effects should be just as likely to occur under self-administered as under face-to-face or telephone conditions because the information presented to respondents (e.g., the terms "forbid" or "allow", or the presence or absence of a middle alternative) is essentially the same under all modes of data collection.

Recall Effects. The recall of information from memory is known to improve with the amount of time that is available to search memory (e.g., Anderson, 1980). Accordingly, recall should be poorest under telephone interview conditions, due to the high degree of time pressure under this mode of data collection, and best under self-administered questionnaire conditions, where respondents usually can take as much time as they like.

For the same reason, differences due to respondents' motivation should be most pronounced under self-administered conditions, and should be least pronounced under telephone conditions, where the pressure of the situation is likely to override any desire to spend more time on the task.

In contrast, techniques that are designed to give the respondent more time to recall information from memory -- e.g., increasing question length through the addition of redundant information (Bradburn, et al., 1979) -- should prove irrelevant under self-administered questionnaire conditions but should affect the obtained responses under face-to-face and telephone conditions.

Social Desirability and Interviewer Effects. For the reasons outlined above, social desirability and interviewer effects should be most pronounced under face-to-face and least pronounced under self-administered conditions.

A Cross Cultural Experiment

These theoretical considerations suggest an extensive research program that is of theoretical as well as applied interest. As a first step, we conducted a cross-cultural experiment in the United States and the Federal Republic of Germany in which we compared the impact of two extreme modes of data collection, namely telephone interviews with an explicit attempt to induce time pressure and self-administered questionnaires, under tightly controlled conditions.

The experiment was conducted in both countries at about the same time, with the same questions, with similar populations: students at the University of Cincinnati, Ohio, U.S.A. and the University of Mannheim,

Federal Republic of Germany. The principal reason for using student subjects, other than limited resources, was our concern that a sufficiently high response rate may not be obtained with a self-administered survey of the general public, whether done by mail or face-to-face delivery. Extreme differences in the response rates of the self-administered and telephone conditions, would thus render any mode effects uninterpretable.

In the present paper, we will focus on question order and context effects as well as the impact of mode of data collection on respondents' recall of information from memory. Results bearing on question wording and question form effects are presented elsewhere (Bishop, Hippler, Schwarz, & Strack, 1988). Suffice it to say that these results provided strong support for the above hypotheses, indicating that question wording and question form effects are just as likely to occur, and as pronounced, under telephone interview conditions as under self-administered questionnaire conditions.

Method

The United States Experiment

The data were collected in February, March, and April of 1986 from a systematic random sample of 724 graduate and undergraduate students selected from a current telephone directory for the University of Cincinnati. Half of these students were randomly assigned to be interviewed by telephone; the other half received the questionnaire in a self-administered form that was personally delivered to the respondent's residence and then returned either by mail or by having it picked up by the person who delivered it, typically the latter. The response rate for the

telephone survey was 83.9%; for the self-administered survey, with an intensive follow-up, it was 76.8%.

In both the telephone and self-administered surveys respondents were randomly assigned to receive either Form A or Form B of the questionnaire (see Appendix).

Replication in West Germany

The conditions under which the data were collected in Germany were somewhat different, though the wording of the questions in the two studies was -- with a few minor exceptions -- essentially identical. The data for the German study were collected during the first two weeks of April, 1986. The subjects for the German investigation were all undergraduates at the University of Mannheim, majoring in law and business administration. They were initially contacted in the classroom and asked to participate in a survey. After they agreed to participate, they were randomly assigned to one of the four conditions: the telephone or self-administered survey and either Form A or B of the questionnaire (see Appendix). Respondents assigned to the self-administered condition received one of the two versions of the questionnaire and were asked to fill it out immediately. Whereas respondents assigned to the telephone condition completed a one-page questionnaire for a separate study in which they were asked on the second page for their telephone number, the best time for contacting them, and their first name. Most of the questionnaires were completed within 12 minutes.

During the following three days the subjects in the telephone condition were interviewed by five professional interviewers. The

interviewers were instructed and trained to go through the interview as quickly as possible. Only 8 of 163 subjects assigned to the telephone condition could not be contacted, resulting in a response rate of 95.1%. A total of 194 self-administered questionnaires and 155 telephone interviews were completed. From the self-administered group 11 people who reported not having a telephone were eliminated from the analysis to make the two samples more comparable. This resulted in a total of 183 subjects in the self-administered condition.

The replication in West Germany, then, was more like a laboratory experiment, conducted partly under field conditions. Whereas the U.S. experiment was more of a field study similar to a typical survey. These variations, however, make the replication all the more valuable, if the results should replicate from one study to the other.

Chart 2 shows the topics and the variations in question form, wording, and context that were used in the experiment.

Chart 2

In the present paper we will address findings on the trade restriction items, the International Trade Act question and the questions about the date of the Falkland Islands war and the Soviet intervention in Afghanistan.

Question Order and Question Context. The questions about restrictions of Japanese imports to the U.S. and of U.S. imports to Japan were adopted from Schuman & Ludwig (1983), and were presented in two sequences. The question about the fictitious "International Trade Act of 1986" was created as a comparable, cross-cultural surrogate for the Agricultural Trade Act

and the Monetary Control Bill investigated by Schuman and Presser (1981, Ch.5) and the 1975 Public Affairs Act studied by Bishop and his colleagues (1980, 1986). It thus represents a conceptual, rather than an exact, replication of previous split-ballot experiments.

Knowledge and Recall. To explore the impact of mode of administration on the veridicality of respondents' recall, respondents were asked to recall the year of the Falkland Islands War and the year the Soviet Union went to war in Afghanistan, hypothesizing that recall is more accurate under self-administered conditions because respondents can take as much time as they like to search memory and to construct different recall cues. In addition, both questions were asked in a short as well as a (redundant) long form, and we expected the long question form to improve recall under telephone interview conditions, due to the increased search time it provides for respondents. Given that the self-administered mode provides for as much time as respondents want, question length was not expected to affect recall under self-administered conditions.

Results

Question Order and Question Context Effects as a Function of Mode of Data Collection

Japanese Trade Issue. In previous research (Schuman & Ludwig, 1983), respondents were found to be more likely to favor limiting Japanese imports to the U.S. than they were to favor limiting U.S. exports to Japan when each question was asked in the first position. Our model would predict that this order effect should replicate under telephone interview conditions but

not under self-administered conditions, where respondents are able to read both questions before answering them.

Schuman and Ludwig's research also showed that support for limiting U.S. exports to Japan increased when the question about it was asked after a question about restrictions on Japanese imports to the U.S., presumably because this question order evokes a norm of even-handedness. In contrast to the above order effect, which requires that respondents are exposed to one question at a time, this aspect of the data pattern should replicate under both modes of administration. In fact, it may be more pronounced under self-administered conditions where respondents can read both questions before answering them and have more time to elaborate the implications of the norm of even-handedness.

Table 1

The data clearly support these predictions, as is shown in Table 1. As in Schuman & Ludwig's (1983) study, respondents were significantly more likely to favor limiting Japanese imports to the United States (69.4%) than they were to favor limiting U.S. exports to Japan (53.8%) when each question was asked in the first position under telephone interview conditions ($X^2=9.6$, $df=1$, $p < .01$). But when respondents were asked these same questions in the self-administered form, the order in which they were presented had -- as expected -- no significant effect on the results.

The norm of even-handedness, on the other hand, was evidently evoked under both modes of administration. Specifically, support for limiting U.S. exports to Japan (67.9%) increased significantly under telephone conditions

when respondents were asked about it immediately after the question about trade restrictions on Japanese imports by the U.S. Furthermore, we found, as did Schuman and Ludwig, that the norm of even-handedness does not necessarily operate with equal force in both directions: support for limiting Japanese imports (67.2%) did not decline significantly, if at all, when respondents were asked about it immediately after the question about limiting U.S. exports to Japan. This asymmetry, as Schuman and Ludwig suggest, may be the result of American perceptions that the (unfair?) Japanese competition for the U.S. market is what needs to be righted by restrictions on imports (cf. the German-Japanese example below).

Under self-administered conditions, on the other hand, the norm of even-handedness was evoked under both order conditions. Given that respondents were able to look at both of the questions about trade restrictions simultaneously, they could not help but realize that a norm of even-handedness or fairness was called for in answering the questions. And that is why we find, unlike the results of the telephone survey, that respondents were not significantly more likely to favor trade restrictions by the United States (68.1%) than they were to favor restrictions by Japan (64.5%) when each question was asked in the first position ($X^2=.53$, $df=1$, n.s.). Indeed, the absence of an order effect on the responses to these questions in the self-administered form is precisely what the norm of even-handedness would lead us to predict -- a confirmation of the theory under different conditions of data collection.

The pattern of the German data is very similar. When respondents were interviewed by phone, the sequence of the questions made a significant difference in the results, but it made little or no difference when the respondents were given a self-administered questionnaire. Unlike the

results of the U.S. experiment, however, a norm of even-handedness appears to have influenced responses to both questions more equally. Support for limiting Japanese imports to Germany (24.4%) declined when respondents were asked about it immediately after the question about trade restrictions by Japan, though the difference was not statistically significant. The effect of the norm may be more symmetrical in the German case because trade relations with Japan are not viewed as unbalanced (or unfair) as they are in the United States. In other words, a necessary condition for the norm to operate with equal force in both directions is a perception that both parties (e.g., nations) are presently engaged in fair and equal competition. Otherwise, the effect of the norm will be asymmetrical, acting to equalize the "unfair" competition.

In summary, these findings indicate that the impact of question order is eliminated when the questions are presented in a self-administered questionnaire, which allows respondents to read both questions before answering them, thus eliminating sequential question presentation. This finding was replicated with the well-known order effect on abortion items (adopted from Schuman & Presser, 1981), as described elsewhere by Bishop, Hippler, Schwarz, & Strack (1988). The impact of question context, i.e., the impact of the content of adjacent questions, on the other hand, was more pronounced under self-administered conditions and emerged independently of question order, as is reflected in the operation of the norm of even-handedness in the present data. In combination, these data strongly support the hypothesis that the simultaneous presentation of questions in a self-administered questionnaire eliminates order effects but may enhance the impact of the content of related questions because respondents have more time to think about their implications. This

assumption is further supported by respondents' answers to the fictitious issue in this experiment.

Fictitious Issues. When presented an ambiguous question, respondents under self-administered conditions are likely to have a better chance to search the context of the ambiguous question to disambiguate its meaning, than do respondents who are interviewed on the telephone. In line with this assumption, respondents in the U.S. as well as the German experiment were significantly more likely to express an opinion on the fictitious International Trade Act, under conditions where the no-opinion alternative was omitted, when they were asked about it in a self-administered questionnaire than on the telephone (see Table 2).

Table 2

And even when a no-opinion alternative was explicitly offered, respondents in the German experiment were more inclined to volunteer an opinion when they were given the self-administered form than when they were interviewed by telephone, although this latter finding did not replicate for U.S. respondents given the offered form of the question. Nonetheless, the data as a whole indicate a greater willingness for at least some respondents to offer an opinion on obscure or fictitious topics when they are asked about it in a self-administered questionnaire than on the telephone. We hypothesized that this pattern results from respondents disambiguating the meaning of the International Trade Act item by referring to the Japanese Trade items asked earlier in the questionnaire. If so, responses to the International Trade Act item should be more strongly

associated with responses to the Japanese Trade items under self-administered than under telephone conditions.

Correlational analyses support this hypothesis for the U.S. as well as the German sample, as shown in Table 3.

Table 3

Specifically, responses to the International Trade Act item were significantly correlated with responses to the Japanese Trade items ($\gamma = .66$ for limiting U.S. imports to Japan, and $.69$ for limiting Japanese imports to the U.S.) when the questions were presented in a self-administered questionnaire, but not when they were asked on the telephone ($\gamma = .16$ and $.11$, respectively). The German data replicate this pattern, though the differences are somewhat smaller.

These findings indicate that respondents in the self-administered questionnaire conditions used the content of related trade restriction items to disambiguate the meaning of the fictitious International Trade Act issue.

In addition, the direction of the effect under self-administered conditions suggests that respondents also used their previous responses to the trade restriction items to infer what their response should be to the International Trade Act item. Specifically, respondents who said "yes" to either trade restrictions by the U.S. or by Japan were significantly more likely than those who said "no" to favor the International Trade Act, and vice versa for those who said "no". Moreover, this pattern seems more pronounced for respondents who said "yes" to both of the trade restriction

items, or "no" to both items, suggesting that they assumed the International Trade Act meant reciprocal trade restrictions. Thus, the norm of even-handedness apparently not only influenced responses to the two trade restriction items, but also responses to the International Trade Act item. Again, the German data parallel these findings, as shown in Table 3.

In combination, these data indicate that respondents under self-administered questionnaire conditions had more opportunity, and were thus more likely, to disambiguate the meaning of an ambiguous item by referring to the content of related items than respondents under telephone interview conditions. Accordingly, they were more likely to provide a substantive answer to begin with, and their substantive answer was more closely related to their answers to the context items that they used to disambiguate the question, much as our model would suggest.

Recall of Information from Memory as a Function of Mode of Data Collection

Turning to the impact of mode of data collection on respondents' recall of information from memory, we will consider respondents' answers to two knowledge questions, namely questions about the date of the Falkland Islands war and the date of the Soviet intervention in Afghanistan. Given that recall improves with the time available to search memory, we expect respondents' answers to be more accurate under self-administered than under telephone interview conditions. For the same reason, increasing question length through the addition of redundant filler words should be likely to improve respondents' recall when interviewed on the telephone, but may show little effect under self-administered conditions, where respondents can use

as much time as they want to think about their answer, independent of the length of the question. We will first examine the proportion of respondents who say that they do not know the answer to the knowledge questions, and will subsequently assess the accuracy of the substantive responses given to these questions.

Don't Knows. An examination of the percentage of respondents who said that they did not know the year of the Falklands Islands war or the year of the Soviet intervention in Afghanistan reveals no significant differences due to either mode of administration or to question length in either the US or Germany. The only exception is provided by US respondents who were more likely to report not knowing the year of the Falkland Islands war when they were asked the long rather than the short form of the question on the telephone ($\chi^2 = 5.65$, $df = 1$, $p < .02$), suggesting that the long form may create more uncertainty, perhaps because long questions communicate that the question is of greater importance to the researcher. Given that this pattern does not replicate for the Afghanistan question, nor for either question in the German sample, and isn't sufficiently strong to result in a significant three-way interaction, it may well be due to chance.

Table 4

Substantive Responses. As shown in Table 5, question length did not affect the percentage of correct, or approximately correct, responses on either question, in either country and under either mode of administration.

Table 5

The way in which the data were collected, however, made a sizable and significant difference in the results. Respondents who received the self-administered questionnaire were significantly more likely to provide a correct answer than respondents who were asked the questions on the telephone. This pattern holds for both questions and in both countries. While US respondents, who filled out the self-administered questionnaire at home, could have "cheated" by looking up the correct answer in a reference book or by asking a friend or household member, the German subjects were unable to do so because they worked on the self-administered questionnaire in a controlled classroom setting. In combination, the findings suggest that "cheating" is unlikely to play any significant role in the improvement of recall under self-administered conditions, indicating that recall increases as respondents have more time to search memory and to generate appropriate recall cues, e.g. other events that occurred at about the same time (cf. Bradburn et al., 1987; Strube, 1987).

Table 6

Finally, an analysis of respondents' errors, as shown in Table 6, proves to be informative. First, the data indicate a considerably higher degree of forward than of backward telescoping in response to both questions, under both administration modes and in both countries, a finding

that presumably reflects the vivid memories that respondents have of these events, which were extensively covered in the media (cf. Brown, Rips, & Shevell, 1985). Second, both types of errors are less likely to be obtained under self-administered than under telephone conditions. Third, if interviewed on the telephone, respondents were more likely to err in the direction of backward telescoping in response to the Falkland Islands question than in response to the Afghanistan question, presumably because the former referred to a past event of short duration while the latter event was still ongoing at the time of the study. This difference was not obtained, however, under the better recall conditions of the self-administered mode.

Conclusions

Together, the findings reported in the present paper as well as in our previous report (Bishop, Hippler, Schwarz, & Strack, 1988) provide considerable support for the hypotheses put forth in the present paper. Specifically, they suggest that question order effects, and primacy or recency effects in general, are significantly less likely to occur in a self-administered survey than in a telephone survey, as is indicated by the responses to the trade restriction items reported in the present paper and conceptually equivalent findings on the well-known abortion items reported in Bishop et al. (1988). This does not mean, however, that effects of question context would not be obtained under self-administered questionnaire conditions. To the contrary, respondents under self-administered questionnaire conditions were more likely to consider the content of related questions in determining their answer, although this

occurred independently of the order in which the questions were asked. Moreover, respondents under self-administered conditions were more likely, and had more opportunity, to use related items to disambiguate the meaning of an ambiguous question. Thus, presenting questions in a self-administered questionnaire rather than in a face-to-face or telephone interview eliminates the impact of question order but may increase the impact of the content of related questions.

Question wording and form effects, on the other hand, appear to be just as likely to occur with one mode of data collection as the other, as is suggested by findings on tone of wording or the presentation and omission of middle alternatives reported elsewhere by Bishop, Hippler, Schwarz, & Strack (1988).

Finally, respondents were found to be more likely to accurately recall information from memory under self-administered conditions than under telephone interview conditions, a finding that reflects the well-known insight that recall increases with the amount of time available to search memory (Anderson, 1980). Question length, on the other hand, did not affect recall in the present study which may either be due to the minimal time difference induced by the variation in question length or to the nature of the task. Note in this regard that the present study assessed the accuracy of recall rather than the amount of recalled material. It may well be that question length increases answer length which, in turn, may increase the likelihood of accurate recall under some specific conditions, but not necessarily the accuracy of recall itself. This possibility awaits further research.

In summary, the findings indicate that some response effects depend on the mode of data collection while others do not. We take the fact that this

dependency could be well predicted on the basis of cognitive variables as encouraging evidence for the fruitfulness of the beginning collaboration of cognitive psychologists and survey researchers.

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Chart 1. Comparison of Psychological Dimensions of Modes of Survey Data Collection

Dimension	Face-to-Face Interview	Telephone Interview	Self-Administered Questionnaire
Visual (V) vs. auditory (A) presentation of the stimuli	A/V	A	V
Sequential (SE) vs. simultaneous (SI) presen- tation of material	SE	SE	SI
Time pressure (+/-)	+	++	0
Additional explanations from interviewer (+/-)	++	+	0
Perceived anonymity/ Social Desirability	—	—	+
Influence of interviewer	++	+	0

Chart 2. Experiments in Question Form, Wording, and Context

	Form A	Form B
<u>Response Order</u>		
Divorce	Middle alt. presented in <u>last</u> position	Middle alt. presented in <u>middle</u> position
Nuclear Power Plants	" "	" "
<u>Question Order</u>		
Abortion	Question on abortion, if birth defect, asked <u>before</u> question about abortion, if woman wants no more children	Question on abortion, if birth defect, asked <u>after</u> question about abortion, if woman wants no more children
Trade with Japan	Question about trade restrictions by Japan asked <u>before</u> question about trade restrictions by U.S./Germany	Question about trade restrictions by Japan asked <u>after</u> question about trade restrictions by U.S./Germany
<u>Middle Response Alt.</u>		
Marijuana Penalties	Middle alt. <u>omitted</u>	Middle alt. <u>offered</u>
Left/Right Pol. ID	Middle alt. <u>offered</u>	Middle alt. <u>omitted</u>
Defense Spending	<u>Middle</u> alt. offered	<u>No opinion</u> alt. offered
<u>No Opinion Alternative</u>		
Arab/Israel Relations	<u>Offered</u>	<u>Omitted</u>
International Trade Act of 1986	<u>Omitted</u>	<u>Offered</u>
<u>Question Length</u>		
Falklands War	Short	Long
Afghanistan	Short	Long
<u>Tone of Wording</u>		
Smoking in Public	Allow	Forbid
<u>Open vs. Closed Form on Work Values</u>		
	Closed	Open

Table 1. Response To Japanese Trade Items By Question Form And Mode Of Data Collection

	Telephone				Self-Administered			
	Limit U.S. Item Asked <u>Before</u> Limit		Limit U.S. Item Asked <u>After</u> Limit		Limit U.S. Item Asked <u>Before</u> Limit		Limit U.S. Item Asked <u>After</u> Limit	
U.S./Japan	Japan	Item	Japan	Item	Japan	Item	Japan	Item
<hr/>								
Should Japan Limit U.S. Imports								
Yes	53.8%		67.9%		64.5%		67.6%	
No	<u>46.2</u>		<u>32.1</u>		<u>35.5</u>		<u>32.4</u>	
	100.0		100.0		100.0		100.0	
	(186)		(187)		(166)		(182)	
	$\chi^2=7.26$, $df=1$, $p<.01$				$\chi^2=0.25$, $df=1$, n.s.			
Three-way interaction (response by form by mode): $\chi^2=2.17$, $df=1$, n.s.								
Should U.S. Limit Japanese Imports								
Yes	67.2%		69.4%		68.1%		68.1%	
No	<u>32.8</u>		<u>30.6</u>		<u>31.9</u>		<u>31.9</u>	
	100.0		100.0		100.0		100.0	
	(186)		(186)		(166)		(182)	
	$\chi^2=0.11$, $df=1$, n.s.				$\chi^2=0.00$, $df=1$, n.s.			
Three-way interaction (response by form by mode): $\chi^2=0.09$, $df=1$, n.s.								

Table 1. (Continued)

	Telephone		Self-Administered	
	Limit Germany Item Asked <u>Before Limit</u> Japan Item	Limit Germany Item Asked <u>After Limit</u> Japan Item	Limit Germany Item Asked <u>Before Limit</u> Japan Item	Limit Germany Item Asked <u>After Limit</u> Japan Item
<hr/>				
Should Japan Limit German Imports				
Yes	12.8%	30.7%	30.0%	25.0%
No	<u>87.2</u>	<u>69.3</u>	<u>70.0</u>	<u>75.0</u>
	100.0 (78)	100.0 (75)	100.0 (90)	100.0 (92)
	$\chi^2=7.34$, $df=1$, $p<.01$		$\chi^2=0.57$, $df=1$, n.s.	
Three-way interaction (response by form by mode): $\chi^2=6.58$, $df=1$, $p<.02$				
Should Germany Limit Japanese Imports				
Yes	24.4%	36.5%	41.1%	33.7%
No	<u>75.6</u>	<u>63.5</u>	<u>58.9</u>	<u>66.3</u>
	100.0 (78)	100.0 (74)	100.0 (90)	100.0 (92)
	$\chi^2=2.65$, $df=1$, $p=.103$		$\chi^2=1.07$, $df=1$, n.s.	
Three-way interaction (response by form by mode): $\chi^2=3.64$, $df=1$, $p=.056$				

Table 2. Response to "International Trade Act of 1986" By Question Form And Mode Of Data Collection

	Telephone		Self-Administered	
	No Opinion Alt. <u>Offered</u>	No Opinion Alt. <u>Omitted</u>	No Opinion Alt. <u>Offered</u>	No Opinion Alt. <u>Omitted</u>
International Trade Act (U.S.)				
Favor	11.6%	37.6%	11.0%	48.2%
Oppose	1.6	13.4	4.4	15.7
No opinion, DK, NA ¹	<u>86.8</u>	<u>48.9</u>	<u>84.6</u>	<u>36.1</u>
	100.0 (190)	99.9 (190)	100.0 (182)	100.0 (166)
	X ² (no opinion, DK, NA vs. other responses) =60.46, df=1, p<.0001		X ² (no opinion, DK, NA vs. other responses) =84.10, df=1, p<.0001	
International Trade Act (Germany)				
Favor	23.7%	64.6%	51.0%	80.2%
Oppose	6.6	5.1	2.2	8.8
No opinion, DK, NA ¹	<u>69.7</u>	<u>30.3</u>	<u>46.7</u>	<u>11.0</u>
	100.0 (76)	100.0 (79)	99.9 (91)	100.0 (92)
	X ² (no opinion, DK, NA vs. other responses) =24.0, df=1, p<.001		X ² (no opinion, DK, NA vs. other responses) =29.43, df=1, p<.001	

¹ NA indicates question was not answered on self-administered form and treated as a DK response.

Table 3. Relationship between Response to International Trade Act Item and Response to Japanese Trade Items by Mode of Data Collection

I. U.S. StudySelf-Administered

Int. Trade Act	Should Japan Limit U.S. Imports		Int. Trade Act	Should U.S. Limit Japanese Imports	
	Yes	No		Yes	No
Favor	85.9%	55.1%	Favor	86.2%	53.2%
Oppose	<u>14.1</u>	<u>44.9</u>	Oppose	<u>13.8</u>	<u>46.8</u>
	100.0 (85)	100.0 (49)		100.0 (87)	100.0 (47)

 $\chi^2=13.97$, $df=1$, $p<.001$ (Gamma = .66) $\chi^2=15.87$, $df=1$, $p<.001$ (Gamma = .69)Telephone

Int. Trade Act	Should Japan Limit U.S. Imports		Int. Trade Act	Should U.S. Limit Japanese Imports	
	Yes	No		Yes	No
Favor	79.6%	73.8%	Favor	78.1%	73.9%
Oppose	<u>20.4</u>	<u>26.2</u>	Oppose	<u>21.9</u>	<u>26.1</u>
	100.0 (54)	100.0 (65)		100.0 (73)	100.0 (46)

 $\chi^2=0.27$, $df=1$, n.s. (Gamma = .16) $\chi^2=0.09$, $df=1$, n.s. (Gamma = .11)

Table 3. (continued)

II. German StudySelf-Administered

Int. Trade Act	Should Japan Limit German Imports		Int. Trade Act	Should Germany Limit Japanese Imports	
	Yes	No		Yes	No
Favor	93.7%	88.2%	Favor	95.2%	87.0%
Oppose	<u>6.3</u>	<u>11.8</u>	Oppose	<u>4.8</u>	<u>13.0</u>
	100.0 (95)	100.0 (34)		100.0 (83)	100.0 (46)

$X^2 = 1.04$, $df=1$, n.s. (Gamma = .33) $X^2 = 2.80$, $df=1$, $p < .10$ (Gamma = .50)

Telephone

Int. Trade Act	Should Japan Limit German Imports		Int. Trade Act	Should Germany Limit Japanese Imports	
	Yes	No		Yes	No
Favor	89.9%	88.9%	Favor	87.3%	100.0%
Oppose	<u>10.1</u>	<u>11.1</u>	Oppose	<u>12.7</u>	<u>0.0</u>
	100.0 (69)	100.0 (9)		100.0 (63)	100.0 (15)

$X^2 = 0.01$, $df=1$, n.s. (Gamma = .05) $X^2 = 2.12$, $df=1$, n.s. (Gamma = -1.00)

Table 4. Response to Falklands and Afghanistan Items by Question Form and Mode of Data Collection

I. U.S. Study

Question Length:	Telephone		Self-Administered	
	Short	Long	Short	Long
Know Year of War in Falkland Islands				
Yes	57.5%	44.7%	45.8%	45.1%
No, DK	$\frac{42.5}{100.0}$ (186)	$\frac{55.3}{100.0}$ (190)	$\frac{54.2}{100.0}$ (166)	$\frac{54.9}{100.0}$ (182)

$$\chi^2 = 5.65, df = 1, p < .02 \quad \chi^2 = 0.00, df = 1, n.s.$$

Three-way interaction (response by form by mode): $\chi^2 = 2.63, df = 1, n.s.$

Question Length:	Telephone		Self-Administered	
	Short	Long	Short	Long
Know Year of War in Afghanistan				
Yes	45.7%	45.3%	34.9%	40.1%
No, DK	$\frac{54.3}{100.0}$ (186)	$\frac{54.7}{100.0}$ (190)	$\frac{65.1}{100.0}$ (166)	$\frac{59.9}{100.0}$ (182)

$$\chi^2 = 0.00, df = 1, n.s. \quad \chi^2 = 0.78, df = 1, n.s.$$

Table 4. (continued)

II. German Study

Question Length:	Telephone		Self-Administered	
	Short	Long	Short	Long
Know Year of War in Falkland Islands				
Yes	82.3%	81.6%	82.4%	81.5%
No, DK	<u>17.7</u>	<u>18.4</u>	<u>17.6</u>	<u>18.5</u>
	100.0	100.0	100.0	100.0
	(79)	(76)	(91)	(92)
	$X^2=0.01, df=1, n.s.$		$X^2=0.02, df=1, n.s.$	
Question Length:	Telephone		Self-Administered	
	Short	Long	Short	Long
Know Year of War in Afghanistan				
Yes	79.7%	68.4%	84.6%	85.9%
No, DK	<u>20.3</u>	<u>31.6</u>	<u>15.4</u>	<u>14.1</u>
	100.0	100.0	100.0	100.0
	(79)	(76)	(91)	(92)
	$X^2=2.60, df=1, n.s.$		$X^2=0.06, df=1, n.s.$	

Table 5. Accuracy of Recall on Falklands and Afghanistan Items by Question Form and Mode of Data Collection

I. U.S. Study

Question Length:	Telephone		Self-Administered	
	Short	Long	Short	Long
Know Year of War in Falkland Islands				
Yes-Correct (1982, 1981-82, or 1982-83)	29.6%	22.4%	40.8%	43.9%
Incorrect Guess	<u>70.4</u>	<u>77.6</u>	<u>59.2</u>	<u>56.1</u>
	100.0 (98)	100.0 (85)	100.0 (76)	100.0 (82)

$$X^2 = 0.88, df = 1, n.s. \quad X^2 = 0.05, df = 1, n.s.$$

$$X^2 (\text{Self-Administered vs. Telephone}) = 9.22, df=1, p < .01$$

Question Length:	Telephone		Self-Administered	
	Short	Long	Short	Long
Know Year of War in Afghanistan				
Yes-Correct (1979, 1978-79, or 1979-80)	31.0%	27.1%	50.9%	38.4%
Incorrect Guess	<u>69.0</u>	<u>72.9</u>	<u>49.1</u>	<u>61.6</u>
	100.0 (84)	100.0 (85)	100.0 (57)	100.0 (73)

$$X^2 = 0.15, df = 1, n.s. \quad X^2 = 1.56, df = 1, n.s.$$

$$X^2 (\text{Self-Administered vs. Telephone}) = 6.45, df=1, p < .02$$

Table 5 (continued).

II. German Study

Question Length:	Telephone		Self-Administered	
	Short	Long	Short	Long
Know Year of War in Falkland Islands				
Yes-Correct (1982, 1981-82, or 1982-83)	29.2%	25.8%	38.7%	48.0%
Incorrect Guess	<u>70.8</u>	<u>74.2</u>	<u>61.3</u>	<u>52.0</u>
	100.0 (65)	100.0 (62)	100.0 (75)	100.0 (75)
$X^2 = 0.19$, $df = 1$, n.s. $X^2 = 1.33$, $df = 1$, n.s.				
X^2 (Self-Administered vs. Telephone) = 7.42, $df=1$, $p<.01$				

Question Length:	Telephone		Self-Administered	
	Short	Long	Short	Long
Know Year of War in Afghanistan				
Yes - Correct (1979, 1978-79, or 1979-80)	25.4%	36.5%	48.1%	46.8%
Incorrect Guess	<u>74.6</u>	<u>63.5</u>	<u>51.9</u>	<u>53.2</u>
	100.0 (63)	100.0 (52)	100.0 (77)	100.0 (79)
$X^2 = 1.67$, $df = 1$, n.s. $X^2 = 0.02$, $df = 1$, n.s.				
X^2 (Self-Administered vs. Telephone) = 7.96, $df=1$, $p<.01$				

Table 6. Telescoping Errors by Mode of Data Collection (question forms combined)

I. U.S. Study

Know Year of War in Falkland Islands	Telephone	Self-Administered
Incorrect Guess (<u>before</u> 1982)	22.1%	13.4%
Yes-Correct (1982, 1981-82, or 1982-83)	26.5	42.7
Incorrect Guess (<u>after</u> 1982)	<u>51.4</u>	<u>43.9</u>
	100.0 (181)	100.0 (157)

$$\chi^2 = 10.96, df = 2, p < .01$$

Know Year of War in Afghanistan	Telephone	Self-Administered
Incorrect Guess (<u>before</u> 1979)	11.9%	11.8%
Yes-Correct (1979, 1978-79, or 1979-80)	29.2	44.9
Incorrect Guess (<u>after</u> 1979)	<u>58.9</u>	<u>43.3</u>
	100.0 (168)	100.0 (127)

$$\chi^2 = 8.35, df = 2, p < .02$$

Table 6 (continued).

II. German Study

Know Year of War in Falkland Islands	Telephone	Self-Administered
Incorrect Guess (before 1982)	19.7%	8.7%
Yes - Correct (1982, 1981-82, or 1982-83)	27.6	43.3
Incorrect Guess (after 1982)	<u>52.7</u>	<u>48.0</u>
	100.0 (127)	100.0 (150)

$$X^2 = 11.14, df = 2, p < .01$$

Know Year of War in Afghanistan	Telephone	Self-Administered
Incorrect Guess (before 1979)	8.7%	6.4%
Yes - Correct (1979, 1978-79, or 1979-80)	30.4	47.4
Incorrect Guess (after 1979)	<u>61.0</u>	<u>46.2</u>
	100.0 (115)	100.0 (156)

$$X^2 = 7.96, df = 2, p < .02$$

Wording of the Questions in the Se

Form A

- | | | |
|----|--|----|
| 1. | In your opinion, should divorce in this country be... | 1. |
| | 1. easier to obtain | |
| | 2. more difficult to obtain | |
| | 3. stay as it is now | |
| 2. | Do you think that the Japanese Government should be allowed to set limits on how much American industry can sell in Japan? | 2. |
| | 1. Yes | |
| | 2. No | |
| 3. | Do you think that the American Government should be allowed to set limits on how much Japanese industry can sell in the United States? | 3. |
| | 1. Yes | |
| | 2. No | |
| 4. | Do you think it should be possible for a pregnant woman to obtain a <u>legal</u> abortion if there is a strong chance of serious defect in the baby? | 4. |
| | 1. Yes | |
| | 2. No | |
| 5. | Do you think it should be possible for a pregnant woman to obtain a <u>legal</u> abortion if she is married and does not want any more children? | 5. |
| | 1. Yes | |
| | 2. No | |

Self-Administered Survey

Form B

In your opinion, should divorce in this country be...

1. easier to obtain
2. stay as it is now
3. more difficult to obtain

Do you think that the American Government should be allowed to set limits on how much Japanese industry can sell in the United States?

1. Yes
2. No

Do you think that the Japanese Government should be allowed to set limits on how much American industry can sell in Japan?

1. Yes
2. No

Do you think it should be possible for a pregnant woman to obtain a legal abortion if she is married and does not want any more children?

1. Yes
2. No

Do you think it should be possible for a pregnant woman to obtain a legal abortion if there is a strong chance of serious defect in the baby?

1. Yes
2. No

Form A

6. Do you think that smoking in public places, such as restaurants, should be allowed?

1. Yes
2. No

7. Some people say that the United States needs to develop new (alternative) power sources from nuclear energy in order to meet our needs for the future. Other people say that the danger to the environment and the possibility of accidents are too great.

What do you think--do you...

1. favor building more nuclear power plants
2. prefer to see all nuclear power plants closed down
3. favor operating only those that are already built

8. In your opinion, should penalties for using marijuana be...

1. more strict
2. less strict

9. Some people believe we should spend less money for defense. Others feel that defense spending should be increased. How about you--do you think defense spending should be...

1. increased
2. decreased
3. continued at the present level

(Continued)

Form B

6. Do you think that smoking in public places, such as restaurants, should be forbidden?
1. Yes
 2. No
7. Some people say that the United States needs to develop new (alternative) power sources from nuclear energy in order to meet our needs for the future. Other people say that the danger to the environment and the possibility of accidents are too great.

What do you think--do you...

1. favor building more nuclear power plants
 2. favor operating only those that are already built
 3. prefer to see all nuclear power plants closed down
8. In your opinion, should the penalties for using marijuana be...
1. more strict
 2. less strict
 3. about the same as they are now
9. Some people believe we should spend less money for defense. Others feel that defense spending should be increased. How about you--do you think defense spending should be...
1. increased
 2. decreased
 3. no opinion

Form A

10. The United Nations has been considering the International Trade Act of 1986. Do you...
 1. favor the passage of this act
 2. oppose the passage of this act

11. On most political issues, would you say you are on the left, on the right, or in the middle?
 1. Left
 2. Right
 3. Middle

12. Do you think the Arab Nations are trying to defeat Israel, trying to work for a real peace with Israel, or do you not have an opinion on that?
 1. Trying to defeat Israel
 2. Trying to work for a real peace with Israel
 3. No opinion

Appendix (Continued)

Form B

10. The United Nations has been considering the International Trade Act of 1986. Do you...

1. favor the passage of this act
2. oppose the passage of this act
3. no opinion

11. On most political issues, would you say you are on the left, or on the right?

1. Left
2. Right

12. Do you think the Arab Nations are trying to defeat Israel, or are they trying to work for a real peace with Israel?

1. Trying to defeat Israel
2. Trying to work for a real peace with Israel

Form A

13. Next is a question about the Falkland Islands. Do you remember the year England went to war over the Falkland Islands?

1. Yes: What year was that?

WRITE-IN

2. No

14. Next is a question about Afghanistan. Do you remember the year the Soviet Union went to war over Afghanistan?

1. Yes: What year was that?

WRITE-IN

2. No

15. The next question is on the subject of work. People look for different things in a job. Which one of the following five things would you most prefer in a job...

01. work that pays well
02. work that gives a feeling of accomplishment
03. work where there is not too much supervision and you make most decisions yourself
04. work that is pleasant and where the other people are nice to work with
05. work that is steady with little chance of being laid-off

13. Next is a question about the Falkland Islands. Do you happen to remember at this time the date, that is, the year in which England made a decision to go to war in order to get control over the islands called the Falkland Islands?
1. Yes: What year was that?
- _____
- WRITE-IN
2. No
14. Next is a question about Afghanistan. Do you happen to remember at this time the date, that is, the year in which the Soviet Union made a decision to go to war in order to get control over the country called Afghanistan?
1. Yes: What year was that?
- _____
- WRITE-IN
2. No
15. The next question is on the subject of work. People look for different things in a job. What would you most prefer in a job?

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